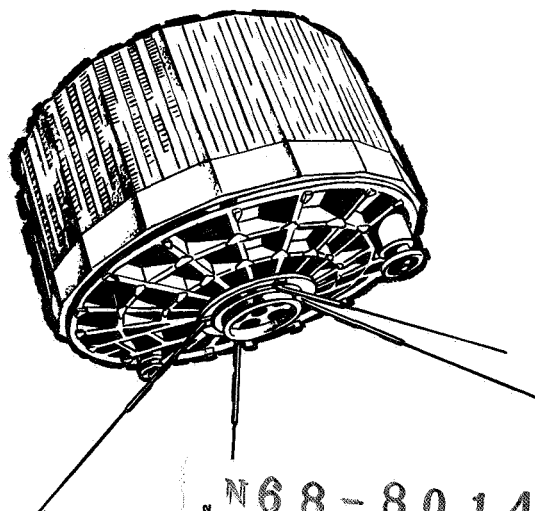


N801C

TIROS

THE FIRST WEATHER SATELLITE



FACILITY FORM 502

N68-80143

(ACCESSION NUMBER)

9

(PAGES)

TMX-60690

(NASA CR OR TMX OR AD NUMBER)

(THRU)

(CODE)

(CATEGORY)

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

WASHINGTON, D.C. 20546

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C., 20402 - Price 10 cents

TMX # 60690

TIROS

The First Weather Satellite

TIROS spacecraft are meteorological satellites which use television cameras for observation of the earth's cloud cover. These satellites are also designed to carry sensors to measure infra-red radiant energy.

The term TIROS is an acronym derived from Television Infra-Red Observation Satellite.

TIROS I was launched on April 1, 1960, beginning a new era in weather observation and communication. Successive launches of later models have made possible observation of weather phenomena on a global scale, on essentially a continuous basis.

A "weather eye" weighing nearly 300 pounds, approximately 400 miles out in space, TIROS looks like a bass drum with needle-like antennas sticking out of its sides.

It contains two independent television camera systems for observing the earth's cloud cover. The latest TIROS models have wide-angle lenses, each capable of photographing an area of approximately 600,000 square miles—roughly equivalent to twice the size of Texas.

Both cameras have specially-developed half-inch vidicon tubes which can store photographs temporarily. An electron beam converts these "stored" photographs into TV-type signals which are sent directly to a ground station or are recorded on a tiny tape recorder for read-out when the satellite is within 1,500 miles of a ground station.

At the ground stations, located at Wallops Island, Va., on San Nicolas Island, Calif., and Fairbanks, Alaska, the pictures are flashed on special TV screens and photographed by 35 mm cameras. These photographs of TV pictures are used by the U.S. Weather Bureau for making weather analyses.

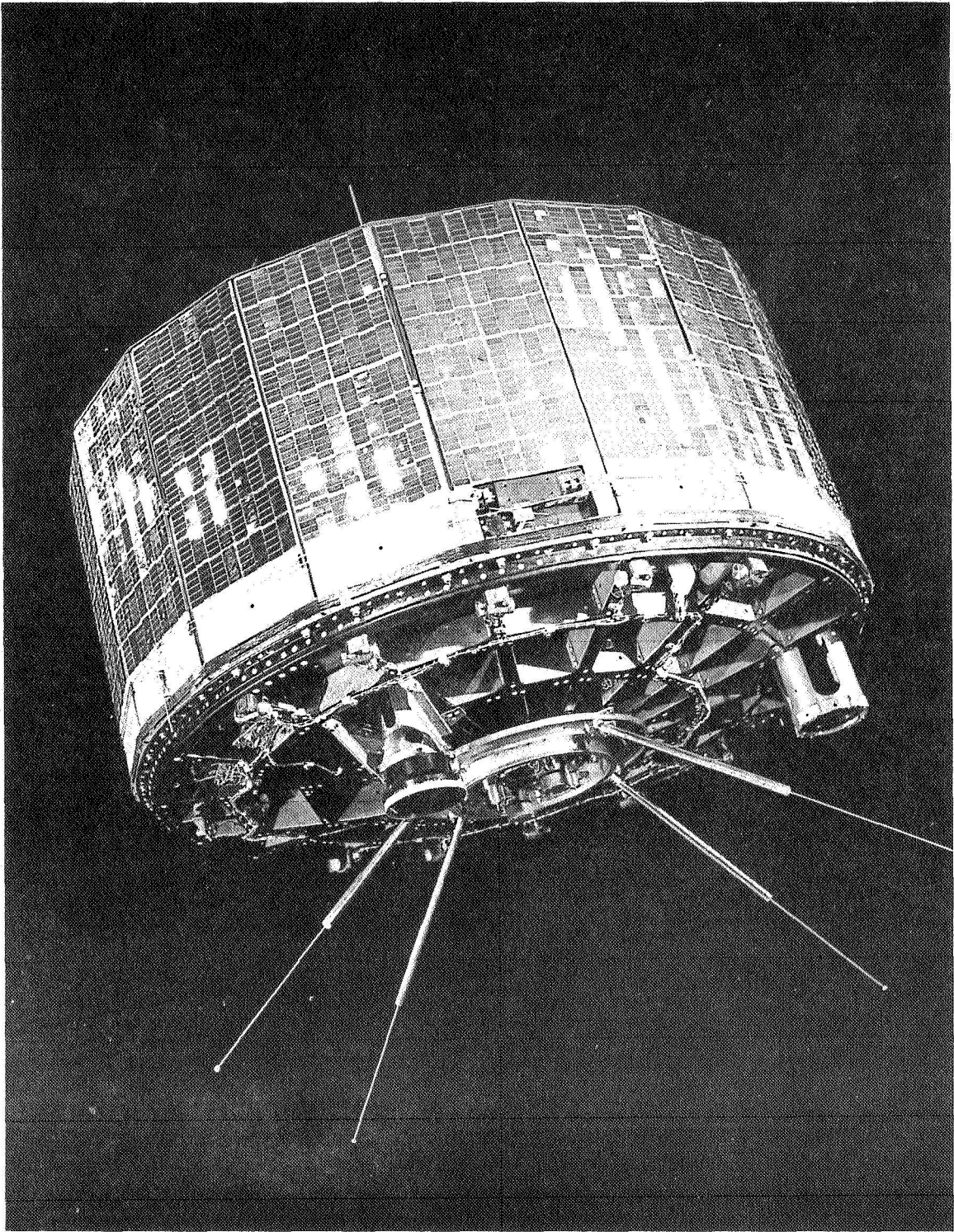
The infra-red equipment, which is used to provide information on how the sun's energy is absorbed and reflected by the earth's atmosphere, records data on tiny tape recorders for playback on command by a ground station.

TIROS has been directly responsible for saving lives and property by giving advance warnings of storms, especially hurricanes, typhoons and large tropical storms. Special missions have been accomplished, for example, ice surveys in the Gulf of St. Lawrence. Special weather advisories have contributed to the success of aviation missions and launches of space vehicles.

In summary, TIROS has:

- Demonstrated that the meteorological satellite is practical as an engineering system, and opened a new era in weather observation.
- Proved that meteorological data obtained from satellites could be used for daily weather analysis.
- Identified hurricane cloud patterns, located them with respect to land masses and followed their movement.
- Distinguished itself as a vehicle for ice study and ice reconnaissance.
- Obtained needed information for the study of the radiation balance of the earth's atmosphere.

The TIROS mission is a project of NASA's Goddard Space Flight Center at Greenbelt, Md.



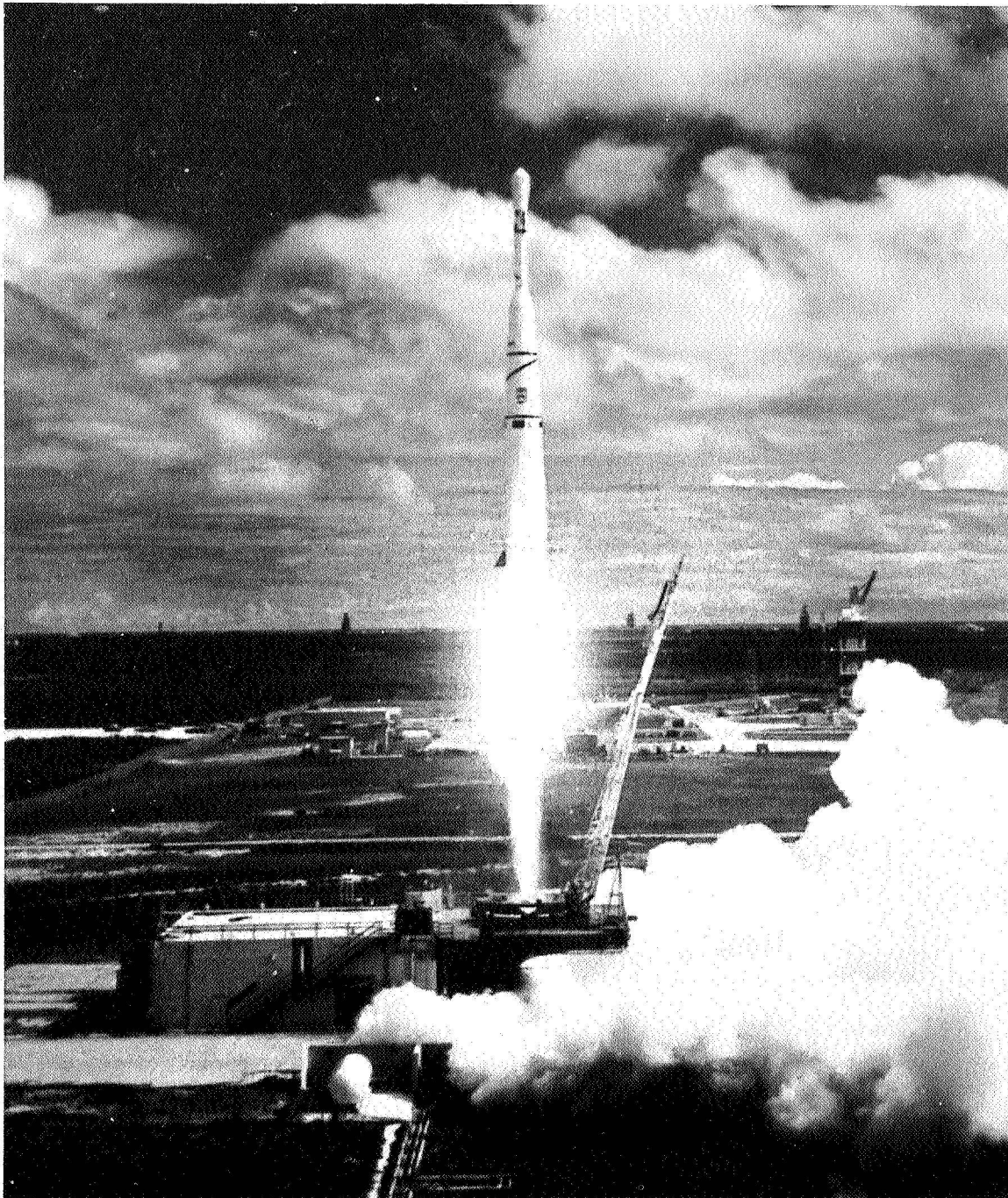
The TIROS Spacecraft.



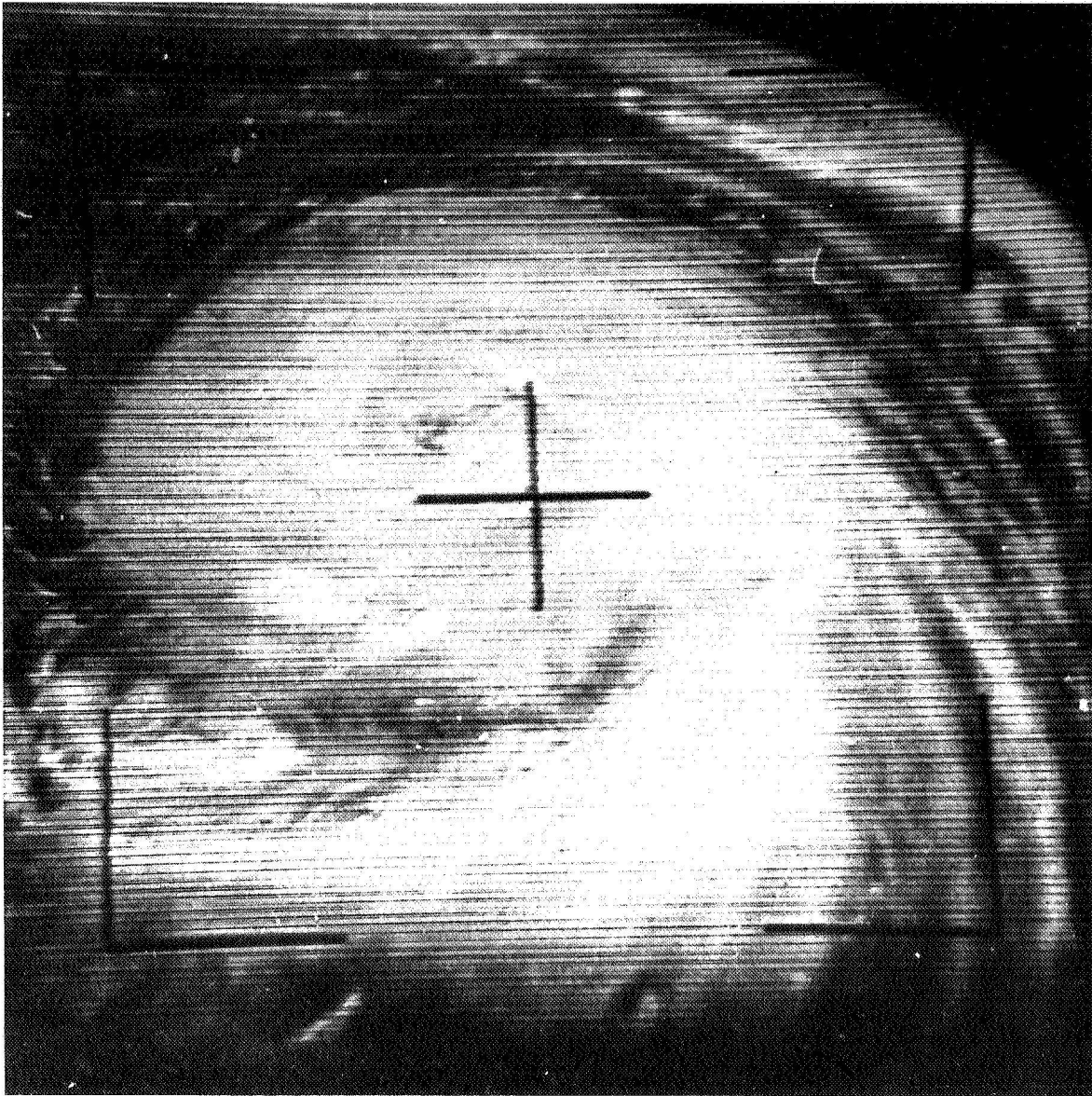
Three-stage NASA Delta Launch Vehicle and the TIROS Spacecraft.



Technicians at Cape Canaveral complete mating of a TIROS payload to the Delta Launch Vehicle. The satellite's solar cells and two TV cameras (at bottom) are plainly visible.



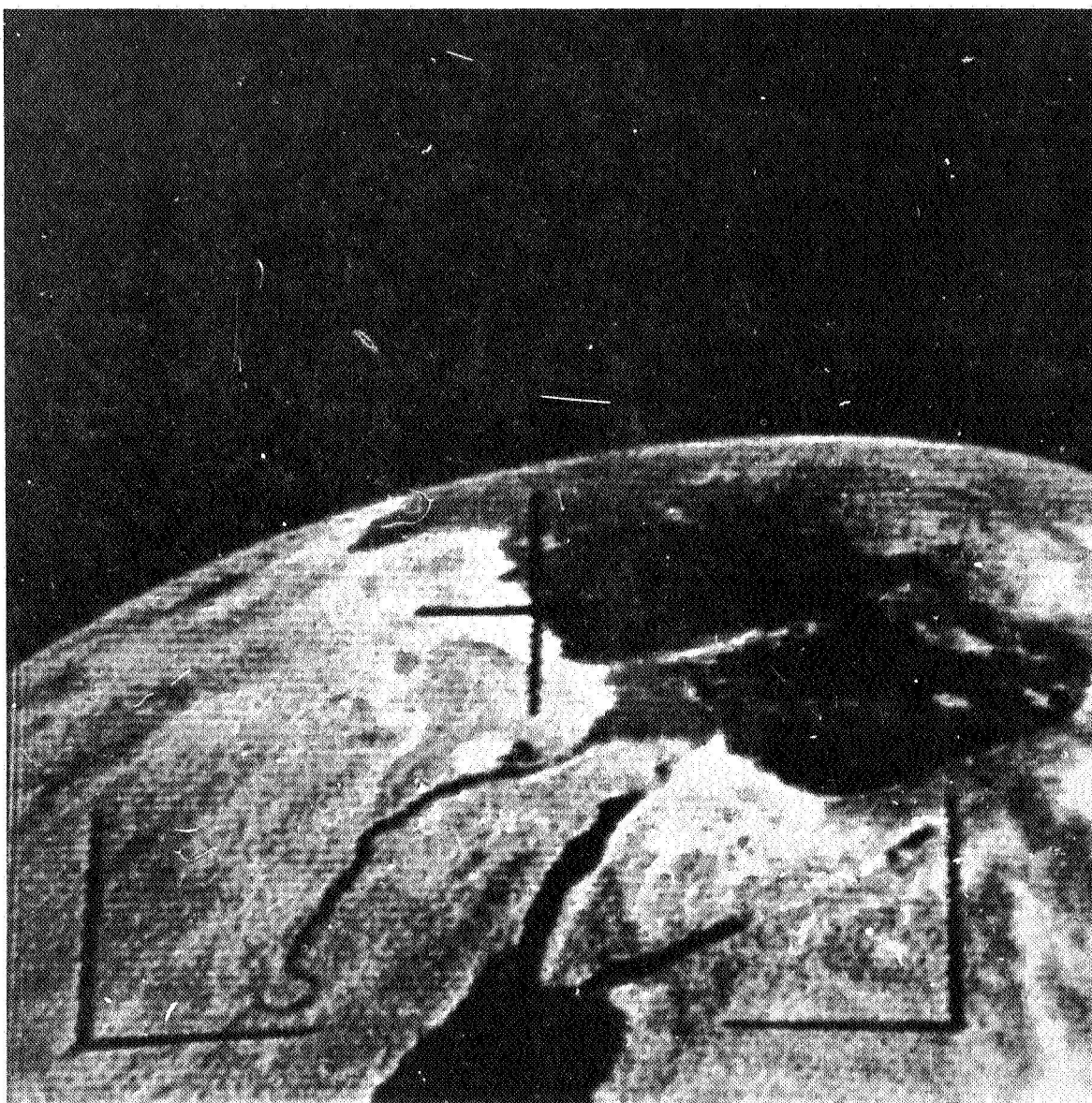
A Delta Launch Vehicle carrying a TIROS Spacecraft lifts off from Cape Canaveral, Fla.



The swirling vortex of Hurricane Daisy—fourth Atlantic tropical storm during 1962—was photographed by the TIROS V weather satellite off the east coast of the U.S. from 400 miles in space. TIROS V detected all tropical storms in the Atlantic and Pacific Oceans during the first half of the 1962 hurricane season.



This TIROS photograph of the boot of Italy, Sicily, and the coast of Tunisia (lower left corner) was taken over the Mediterranean from 400 miles in space. The TIROS weather satellite program—one of the nation's most successful space ventures—is under the technical direction of the NASA Goddard Space Flight Center, Greenbelt, Md.



This view of the Nile River and its delta, the Red Sea, and the eastern Mediterranean was taken by TIROS III from almost 400 miles in space.

TIROS, THE FIRST WEATHER SATELLITE is an educational resource of the Office of Educational Programs and Services, National Aeronautics and Space Administration, Washington, D.C., 20546